

PATENT COOPERATION TREATY
PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
 (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference TU04-0730WO1	FOR FURTHER ACTION	
		See Form PCT/IPEA/416
International application No. PCT/JP2004/012083	International filing date (<i>day/month/year</i>) 24.08.2004	Priority date (<i>day/month/year</i>) 12.09.2003
International Patent Classification (IPC) or national classification and IPC C23C14/34		
Applicant NIKKO MATERIALS CO., LTD.		

<ol style="list-style-type: none"> 1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of 5 sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: <ol style="list-style-type: none"> a. <input type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of _____ sheets, as follows: <table border="0" style="margin-left: 20px;"> <tr> <td><input type="checkbox"/></td> <td>sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</td> </tr> <tr> <td><input type="checkbox"/></td> <td>sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</td> </tr> </table> b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions). 		<input type="checkbox"/>	sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).	<input type="checkbox"/>	sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.																				
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<ol style="list-style-type: none"> 4. This report contains indications relating to the following items: <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> 		<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Faxsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2004/012083

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on translations from the original language into the following which is the language of a translation furnished for the purposes of:

 - international search (Rule 12.3 and 23.1(b))
 - publication of the international application (Rule 12.4)
 - international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

the international application as originally filed/furnished

the description:
 pages _____ as originally filed/furnished
 pages* _____ received by this Authority on _____
 pages* _____ received by this Authority on _____

the claims:
 nos. _____ as originally filed/furnished
 nos.* _____ as amended (together with any statement) under Article 19
 nos.* _____ received by this Authority on _____
 nos.* _____ received by this Authority on _____

the drawings:
 sheets _____ as originally filed/furnished
 sheets* _____ received by this Authority on _____
 sheets* _____ received by this Authority on _____

a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing
3. The amendments have resulted in the cancellation of:

the description, pages _____
 the claims, nos. _____
 the drawings, sheets/figs _____
 the sequence listing (*specify*): _____
 any table(s) related to sequence listing (*specify*): _____
4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages _____
 the claims, nos. _____
 the drawings, sheets/figs _____
 the sequence listing (*specify*): _____
 any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement																									
<p>1. Statement</p> <table> <tr> <td>Novelty (N)</td> <td>Claims</td> <td>1-8</td> <td>YES</td> </tr> <tr> <td></td> <td>Claims</td> <td></td> <td>NO</td> </tr> <tr> <td>Inventive step (IS)</td> <td>Claims</td> <td></td> <td>YES</td> </tr> <tr> <td></td> <td>Claims</td> <td>1-8</td> <td>NO</td> </tr> <tr> <td>Industrial applicability (IA)</td> <td>Claims</td> <td>1-8</td> <td>YES</td> </tr> <tr> <td></td> <td>Claims</td> <td></td> <td>NO</td> </tr> </table>		Novelty (N)	Claims	1-8	YES		Claims		NO	Inventive step (IS)	Claims		YES		Claims	1-8	NO	Industrial applicability (IA)	Claims	1-8	YES		Claims		NO
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<p>2. Citations and explanations (Rule 70.7)</p> <p>Document 1: Akira Suzuki, Atsushi Fukushima, "Sputtering Zai no Kaihatsu Doko", Denshi Zairyo, 1 July 2002, Vol. 41, No. 7, pages 44 to 48, particularly page 47, left column, line 10 to right column, line 13</p> <p>Document 2: Shiro Tsukamoto, Atsushi Fukushima, Akio Yasuoka, "Zairyo kara Kako Gijutsu o Minaosu Hisakuzai kara Mita Kakushu Zairyo no Tokucho Koyuten Kinzoku", Kikai Gijutsu, 1 December 2002, Vol. 50, No. 13, pages 60 to 61, particularly, page 61, left column, 2nd line from the bottom to right column, line 23</p> <p>Document 3: JP 11-001766 A (Japan Energy Corporation), 6 January 1999, claims & EP 872572 A1 & KR 286206 B & US 6153315 A</p> <p>Document 4: JP 2001-098367 A (Praxair ST Technology Inc.), 10 April 2001, entire text & EP 1074639 A1 & US 6283357 B1</p> <p>Document 5: WO 03/046250 A1 (Nikko Materials Co., Ltd.), 6 May 2003, entire text (Family: none)</p>																									

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Claims 1 to 3, 7 and 8

The inventions set forth in claims 1 to 3, 7 and 8 do not involve an inventive step in the light of documents 1 to 3 cited in the international search report.

Document 1 sets forth a hollow cathode sputtering target, wherein the crystalline state of the inner bottom surface and the crystalline state of the inside inner peripheral surface must be made uniform. (As described in document 5 cited in the international search report, it is known that the inner bottom surface and the inside inner peripheral surface of a hollow cathode sputtering target are both parts which are subject to erosion, and document 1 is understood to indicate that the crystalline state of the inner bottom surface and inside inner peripheral surface which are parts that are subject to erosion are made uniform). Document 2 indicates that in order to make the film thickness uniform, it is necessary to control not only the crystalline state of the sputtering target but also the surface finishing state by polishing the surface, and document 3 indicates that the roughness of surfaces of the target which are subject to erosion is set to $R_a \leq 1.0\mu m$ or $R_a \leq 0.2\mu m$ to ensure a uniform film thickness.

It would therefore be easy for a person skilled in the art to set the inner bottom surface and inside inner peripheral surface which are the parts of a target which are subject to erosion to a uniform roughness of $R_a \leq 0.5\mu m$ in order to ensure a uniform film thickness in the hollow cathode sputtering target set forth in document 1.

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Claims 4 and 5

The invention set forth in claims 4 and 5 does not involve an inventive step in the light of documents 1 to 3 cited in the international search report. Even with reference to the description it is not clear to which portion the "outer peripheral edge portion" set forth in claims 4 and 5 refers, but as the applicant states in paragraph [0005] of the description, it is a known technique to roughen the surface of parts of a target which are not subject to erosion, therefore it would be easy for a person skilled in the art to roughen using blast treatment the "outer peripheral edge part" which may be deemed to be a part of the target which is not subject to erosion.

Claim 6

The invention set forth in claim 6 does not involve an inventive step in the light of documents 1 to 4 cited in the international search report. Document 4 sets forth a cladding-coated target, and a person skilled in the art would be capable of employing a cladding-coated target as necessary.